FluWatch

Public Health Agency of Canada | Agence de la santé publique du Canada

January 11 to January 17, 2015 (week 02)

Overall Summary

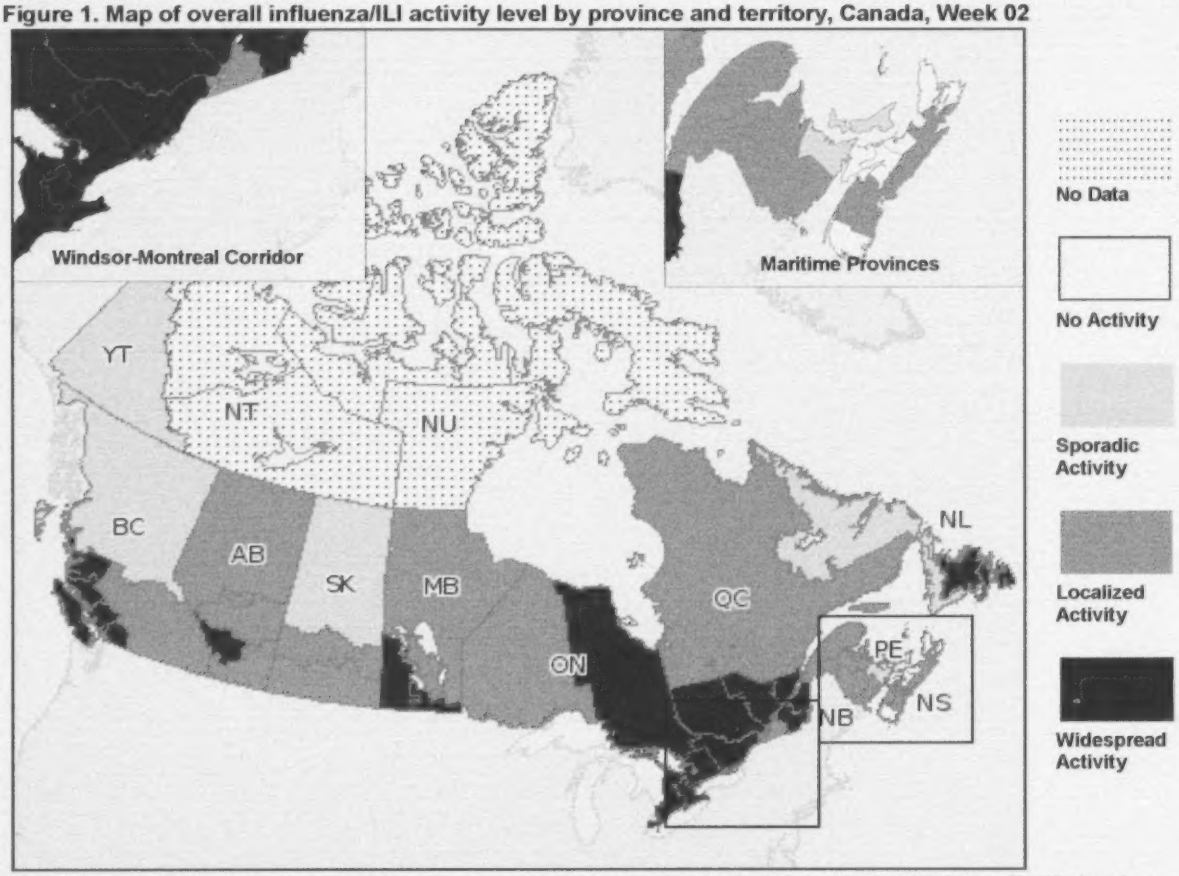
- In week 2, influenza activity levels decreased slightly from the previous week with fewer regions reporting widespread activity. Many regions continue to report localized and sporadic influenza activity.
- Several indicators (number of laboratory detections, outbreaks and hospitalizations, and the ILI consultation rate) declined from the previous week, indicating that peak of the influenza season in Canada may have passed.
- RSV is the second most frequently detected virus after influenza and since week 38 detections of RSV have been higher than in the previous season.
- A(H3N2) continues to be the most common type of influenza affecting Canadians. In both laboratory detections, hospitalizations and deaths, the majority of cases have been among seniors ≥65 years of age.
- To date, the NML has found that the majority of A(H3N2) influenza specimens are not optimally matched to the vaccine strain. This may result in reduced vaccine effectiveness against the A(H3N2) virus. However, the vaccine can still provide some protection against A(H3N2) influenza illness and can offer protection against other influenza strains such as A(H1N1) and B. Data from the NML suggests that the circulating A(H1N1) and B strains are good match for this year's vaccine and will continue to provide protection for the rest of the flu season.

Are you a primary health care practitioner (General Practitioner, Nurse Practitioner or Registered Nurse) interested in becoming a FluWatch sentinel for the 2014-15 influenza season? Contact us at FluWatch@phac-aspc.gc.ca

Influenza/ILI Activity (geographic spread)

In week 02, 17 regions reported widespread activity: in BC(3), AB(1), MB(2), ON(6), QC(3) and NF(2). Twenty four regions reported localized activity: in BC (1), AB (4) SK (2), MB(3), ON (1),QC(3), NB(6), and NS(4), seven regions reported sporadic activity: in YT (1), BC(1), SK(1), NB(1), PE(1) and NF(2). One province reported no activity in 5 regions (NS) and no data were received from NT and NU.

Figure 1. Map of overall influenza/ILI activity level by province and territory, Canada, Week 02

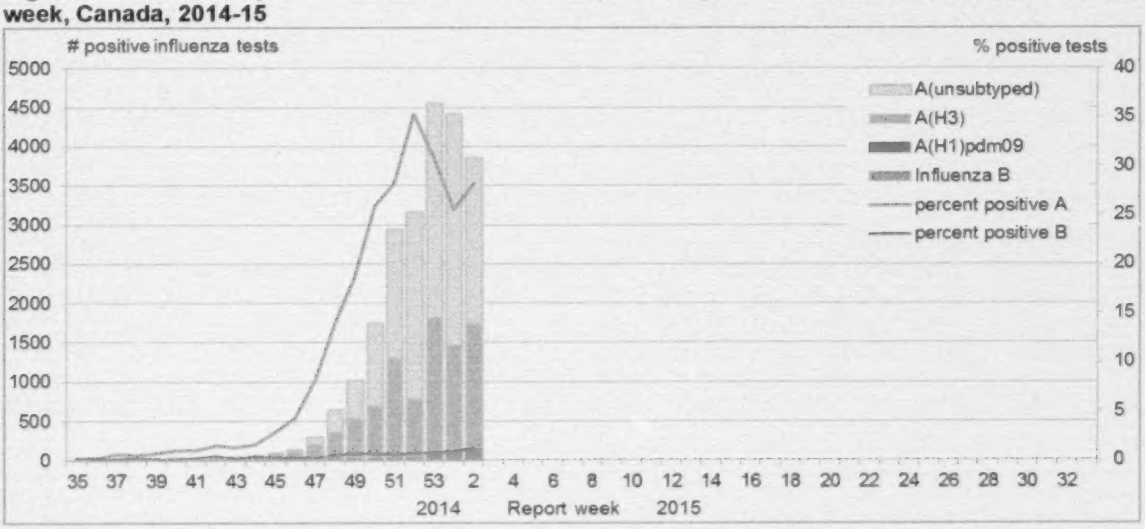


Note: Influenza/ILI activity levels, as represented on this map, are assigned and reported by Provincial and Territorial Ministries of Health, based on laboratory confirmations, sentinel ILI rates and reported outbreaks. Please refer to detailed definitions at the end of the report. Maps from previous

Influenza and Other Respiratory Virus Detections

The number of positive tests decreased from 4,579 in week 01 to 3,761 in week 02; however the percentage of positive influenza tests increased slightly from 26.4% to 29.5% (Figure 2). This may be an indication that we have reached the peak in laboratory detections with the percent positive for influenza peaking in week 52 (35.9%) and the number of positive influenza tests peaking in week 53. To date, 97% of influenza detections have been influenza A, and 99.8% of those subtyped have been A(H3) (Table 1). The timing of the season and predominant A(H3N2) subtype is similar to the pattern observed during the 2012-13 influenza season when percent positive for influenza peaked in week 52 (35%). To date, among the cases of influenza with reported age, the largest proportion was in adults ≥65 years of age (63%) (Table 2).

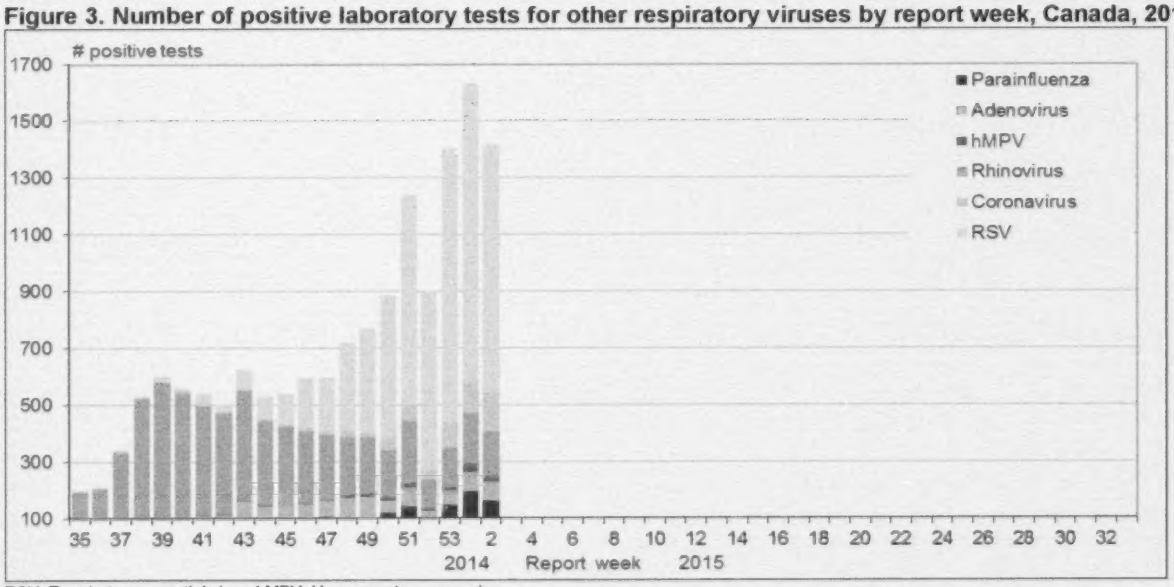
Figure 2. Number of positive influenza tests and percentage of tests positive, by type, subtype and report week, Canada, 2014-15



In week 02, the number of positive RSV tests decreased to 875 RSV detections from 1047 RSV detections in week 01. RSV remains the second most frequently detected virus after influenza. Detections of RSV since week 38 have been higher than in the previous season while detections of parainfluenza and adenovirus continue to follow their seasonal patterns of broad winter circulation (Figure 3).

For more details, see the weekly Respiratory Virus Detections in Canada Report.

Figure 3. Number of positive laboratory tests for other respiratory viruses by report week, Canada, 2014-15



RSV: Respiratory syncytial virus; hMPV: Human metapneumovirus

Table 1. Weekly and cumulative numbers of positive influenza specimens by type, subtype and province, Canada, 2014-15

Reporting provinces[1]	Weekly (January 11, 2015 to January 17, 2015)					Cumulative (August 24, 2014 to January 17, 2015)				
	Influenza A				B	Influenza A				B
	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total	A Total	A(H1)pdm09	A(H3)	A(UnS)	B Total
BC	961	0	720	241	7	1872	2	1446	424	46
AB	213	0	170	43	48	3211	1	3065	145	190
SK	89	0	0	89	4	987	0	0	987	9
MB	210	0	34	176	5	1105	0	326	779	24
ON	1,100	0	491	609	16	5722	5	2421	3296	75
QC	838	0	0	838	74	8626	3	422	8201	317
NB	62	0	0	62	1	132	0	5	127	3
NS	63	0	26	37	4	135	0	55	80	13
PE	14	0	14	0	0	37	1	34	2	1
NL	52	0	0	52	0	394	0	53	341	2
Canada	**3,602**	**0**	**1,455**	**2,147**	**159**	**22221**	**12**	**7827**	**14382**	**680**
Percentage[2]	95.8%	0.0%	40.4%	59.6%	4.2%	97.0%	0.1%	35.2%	64.7%	3.0%

Table 2. Weekly and cumulative numbers of positive influenza specimens by type, subtype and age-group reported through case-based laboratory reporting[3], Canada, 2014-15

Age groups (years)	Weekly (January 11, 2015 to January 17, 2015)					Cumulative (August 24, 2014 to January 17, 2015)						
	Influenza A				B	Influenza A				B	Influenza A and B	
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	#	%
<5	124	0	16	108	6	1399	4	577	818	65	1464	6.7%
5-19	85	0	12	73	13	1228	0	673	555	77	1305	6.0%
20-44	178	0	31	147	19	2423	1	1033	1389	100	2523	11.6%
45-64	204	0	33	171	36	2591	1	954	1636	141	2732	12.6%
65+	1,223	0	233	990	59	13388	4	4550	8834	260	13648	62.8%
Unknown	3	0	1	2	1	44	0	31	13	2	46	0.2%
Total	1,817	0	326	1,491	134	21073	10	7818	13245	645	21718	100.0%
Percentage[2]	93.1%	0.0%	17.9%	82.1%	6.9%	97.0%	0.0%	37.1%	62.9%	3.0%		

[1] Specimens from NT, YT, and NU are sent to reference laboratories in other provinces. Cumulative data includes updates to previous weeks.
[2] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
[3] Table 2 includes specimens for which demographic information was reported. These represent a subset of all positive influenza cases reported.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Antiviral Resistance

During the 2014-2015 influenza season, NML has tested 280 influenza viruses for resistance to oseltamivir and 278 influenza viruses for resistance to zanamivir and all were sensitive to both agents. A total of 512 (99.8%) of influenza A viruses tested for amantadine resistance were resistant (Table 3).

Table 3. Antiviral resistance by influenza virus type and subtype, Canada, 2014-15

Virus type and subtype	Oseltamivir		Zanamivir		Amantadine	
	# tested	# resistant (%)	# tested	# resistant (%)	# tested	# resistant (%)
A (H3N2)	237	0	235	0	511	510 (99.8%)
A (H1N1)	2	0	2	0	2	2 (100%)
B	41	0	41	0	NA[1]	NA[1]
TOTAL	280	0	278	0	513	512

[1]NA: Not Applicable

Influenza Strain Characterizations

During the 2014-2015 influenza season, the National Microbiology Laboratory (NML) has characterized 106 influenza viruses [62 A(H3N2), 2 A(H1N1) and 42 influenza B]. The majority of circulating influenza B and A(H1N1) viruses have been antigenically similar (good match) to the recommended strains for the 2014-15 seasonal influenza vaccine, while the majority of A(H3N2) viruses have shown evidence of an antigenic drift (sub-optimal match) from the vaccine strain.
Influenza A (H3N2): When tested by hemagglutination inhibition (HI) assay (n=62), one virus was antigenically similar to A/Texas/50/2012, five showed reduced titers to A/Texas/50/2012 and 56 were antigenically similar to A/Switzerland/9715293/2013, which is the influenza A(H3N2) component recommended for the 2015 Southern Hemisphere influenza vaccine. Additionally, 395 A(H3N2) viruses were unable to be tested by HI assay; however, sequence analysis showed that 393 belonged to a genetic group that typically shows reduced titers to A/Texas/50/2012. **Influenza A(H1N1):** Two A(H1N1) viruses characterized were antigenically similar to A/California/7/2009. **Influenza B:** Of the 42 influenza B viruses characterized, 38 viruses were antigenically similar to B/Massachusetts/2/2012, three viruses showed reduced titers to B/Massachusetts/2/2012 and one was B/Brisbane/60/2008-like (Figure 4).

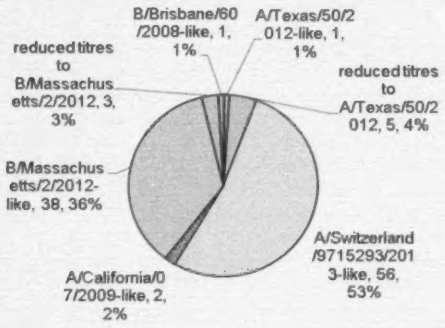


Figure 4. Influenza strain characterizations, Canada, 2014-15, N = 106

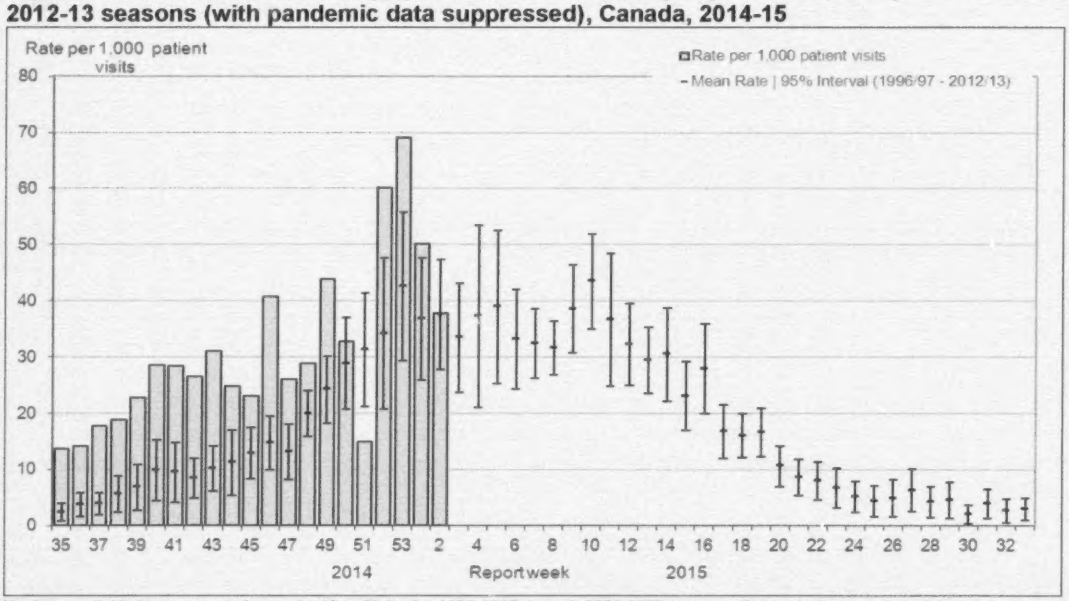
The NML receives a proportion of the number of influenza positive specimens from provincial laboratories for strain characterization and antiviral resistance testing. Characterization data reflect the results of haemagglutination inhibition (HAI) testing compared to the reference influenza strains recommended by WHO.

The recommended components for the 2014-2015 northern hemisphere trivalent influenza vaccine include: an A/California/7/2009(H1N1)pdm09-like virus, an A/Texas/50/2012 (H3N2)-like virus, and a B/Massachusetts/2/2012-like virus (Yamagata lineage). For quadrivalent vaccines, the addition of a B/Brisbane/60/2008-like virus is recommended.

Influenza-like Illness Consultation Rate

The national influenza-like-illness (ILI) consultation rate decreased in week 02 to 37.7 ILI consultations per 1,000 patient visits, which is within expected levels for week 02 (Figure 5). The rates were highest among the 20 to 64 and <5 year age group (55.9 and 50.0 ILI consultations per 1,000).

Figure 5. Influenza-like-illness (ILI) consultation rates by report week, compared to the 1996-97 through to 2012-13 seasons (with pandemic data suppressed), Canada, 2014-15

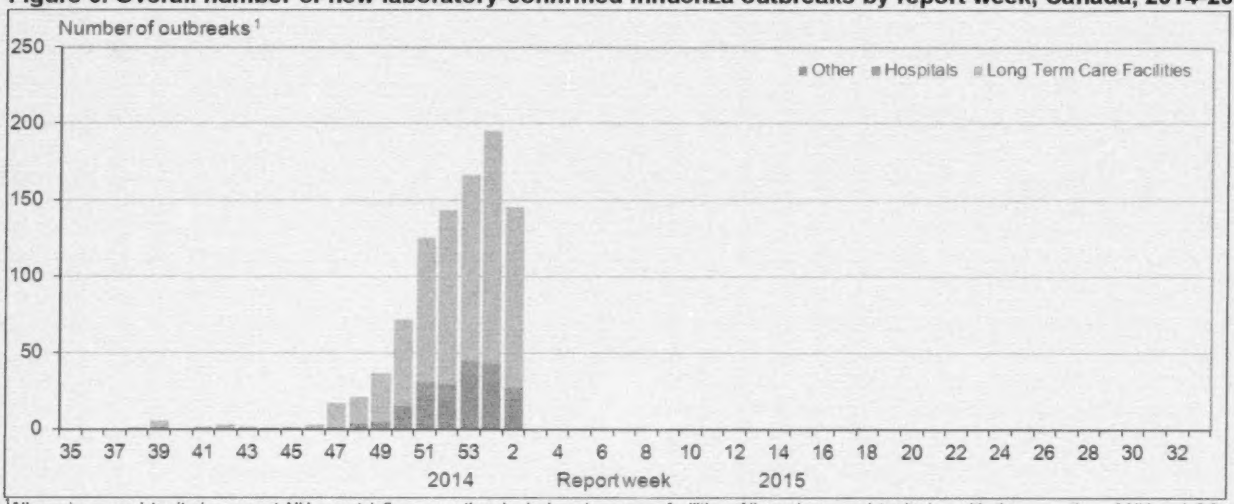


No data available for mean rate for weeks 19 to 39 for the 1996-1997 through 2002-2003 seasons. Delays in the reporting of data may cause data to change retrospectively. The calculation of the average ILI consultation rate over 17 seasons was aligned with influenza activity in each season. In BC, AB, and SK, data is compiled by a provincial sentinel surveillance program for reporting to FluWatch. Not all sentinel physicians report every week.
NOTE: The ILI consultation rate for week 51 should be interpreted with caution due to very low sentinel reporting rates over the holiday season.

Influenza Outbreak Surveillance

In week 02, 145 new outbreaks of influenza were reported (118 in long-term care facilities (LTCF), eight in hospitals and 19 in institutional or community settings) and is fewer than the number of outbreaks reported in week 01 (Figure 6). Among the outbreaks in which the influenza subtype was known, three LTCF outbreaks were associated with A(H3N2). To date this season, 741 outbreaks in LTCFs have been reported. The number of outbreaks reported since week 47 is above those of previous seasons and is similar to the numbers reported during the 2012-13 influenza season when influenza A(H3N2) also predominated.

Figure 6. Overall number of new laboratory-confirmed influenza outbreaks by report week, Canada, 2014-2015

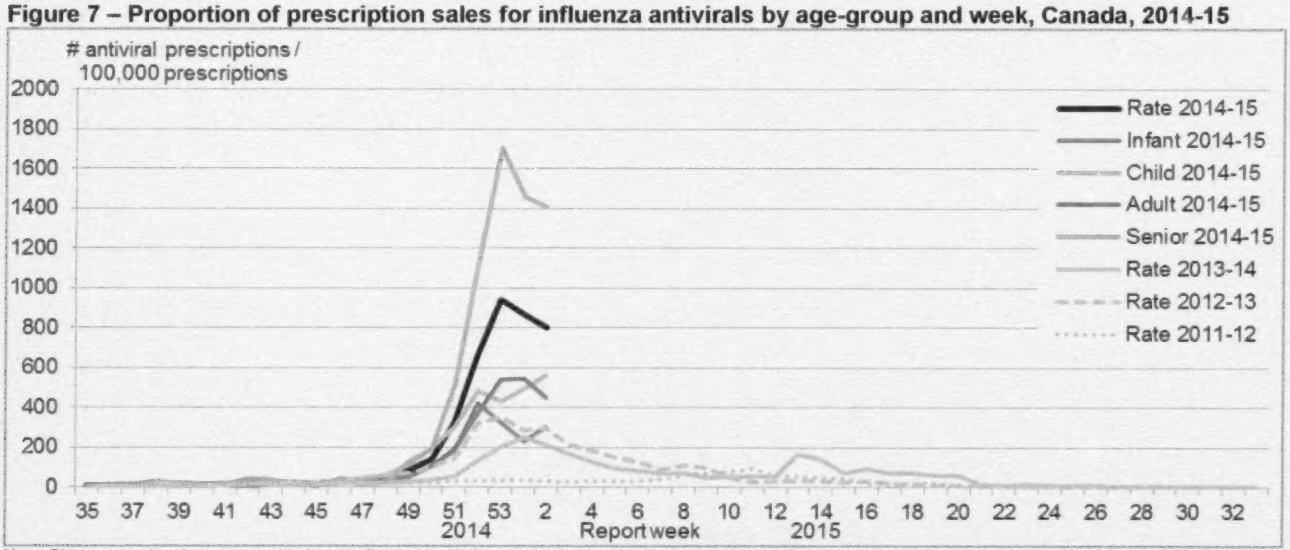


[1]All provinces and territories except NU report influenza outbreaks in long-term care facilities. All provinces and territories with the exception of NU and QC report outbreaks in hospitals. Outbreaks of influenza or influenza-like-illness in other facilities are reported to FluWatch but reporting varies between jurisdictions. Outbreak definitions are included at the end of the report.

Pharmacy Surveillance

During week 02, the proportion of prescription sales for antivirals decreased to 799.8 antiviral prescriptions per 100,000 total prescriptions (down from 870.2 per 100,000 total prescriptions). The antiviral prescription rate increased in infants in week 2. The rate for antivirals since week 48 has been higher than the previous three seasons (Figure 7). The antiviral prescription rate remains the highest amongst seniors at 1,405.1 per 100,000 total prescriptions.

Figure 7 – Proportion of prescription sales for influenza antivirals by age-group and week, Canada, 2014-15



Note: Pharmacy sales data are provided to the Public Health Agency of Canada by Rx Canada Inc. and sourced from major retail drug chains representing over 2,500 stores nationwide (excluding Nunavut) in 85% of Health Regions. Data provided include the number of new antiviral prescriptions (for Tamiflu and Relenza) and the total number of new prescriptions dispensed by Province/Territory and age group. Age-groups: Infant: 0-2y, Child: 2-18y; Adult: 19-64y, Senior: ≥65y

Sentinel Hospital Influenza Surveillance

Paediatric Influenza Hospitalizations and Deaths (IMPACT)

In week 02, 42 laboratory-confirmed influenza-associated paediatric (≤16 years of age) hospitalizations were reported by the Immunization Monitoring Program Active (IMPACT) network: 40 cases of influenza A and two cases of influenza B (Figure 8a). Among the reported cases, 20 (48%) were <2 years of age, 13 (31%) were 2 to 9 years of age and 9 (21%) were 10-16 years of age. Four cases were admitted to the ICU. To date this season, 408 hospitalizations have been reported by the IMPACT network, 384 (94%) of which were cases of influenza A. Among cases for which the influenza A subtype was reported, 98% (132/134) were A(H3N2). Children <5 years of age represented 62% of cases (Table 4). To date, 46 cases were admitted to the ICU, of which 30 (65%) were 2 to 9 years of age (Figure 9a).

Note: The number of hospitalizations reported through IMPACT represents a subset of all influenza-associated paediatric hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Adult Influenza Hospitalizations and Deaths (PCIRN)

In week 02, 121 laboratory-confirmed influenza-associated adult (≥16 years of age) hospitalizations were reported by the PHAC/CIHR Influenza Research Network (PCIRN) Serious Outcomes Surveillance (SOS) network, compared to 211 in week 01. Among the 121 cases in week 02, 102 (84%) were in adults over the age of 65 and all cases (100%) had influenza A (Figure 8b). To date this season, 884 cases have been reported; 875 (99%) with influenza A. The majority of cases (84%) were among adults ≥65 years of age (Table 5). To date, 118 ICU admissions have been reported and the majority of cases (79.7%) were adults ≥65 years of age, most (74%) with known underlying conditions or comorbidities. Seventy-three deaths have been reported, all but six were adults >65 years of age (Figure 9b).

Note: The number of hospitalizations reported through PCIRN represents a subset of all influenza-associated adult hospitalizations in Canada. Delays in the reporting of data may cause data to change retrospectively.

Table 4 – Cumulative numbers of paediatric hospitalizations with influenza reported by the IMPACT network, Canada, 2014-15

Age groups	Cumulative (24 Aug. 2014 to 17 Jan. 2014)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)[2]	Total	# (%)
0-5m	60	0	13	47	2	62 (15.2%)
6-23m	81	1	26	54	10	91 (22.3%)
2-4y	94	1	34	59	4	98 (24.0%)
5-9y	94	0	36	58	5	99 (24.3%)
10-16y	55	0	23	32	3	58 (14.2%)
Total	384	2	132	250	24	408
%[1]	94.1%	0.5%	34.4%	65.1%	5.9%	100.0%

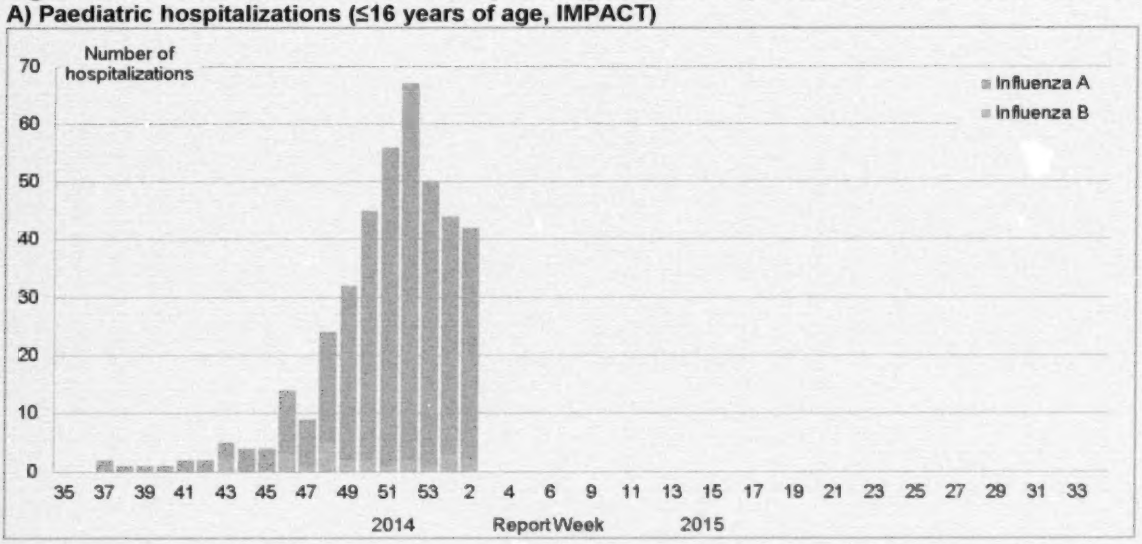
Table 5 – Cumulative numbers of adult hospitalizations with influenza reported by the PCIRN-SOS network, Canada, 2014-15

Age groups (years)	Cumulative (15 Nov. 2014 to 17 Jan. 2015)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
16-20	3	0	0	3	0	3 (%)
20-44	50	0	15	35	1	51 (6%)
45-64	85	0	29	56	2	87 (10%)
65+	737	1	196	540	6	743 (84%)
Total	875	1	240	634	9	884
%	99%	0%	27%	72%	1%	100%

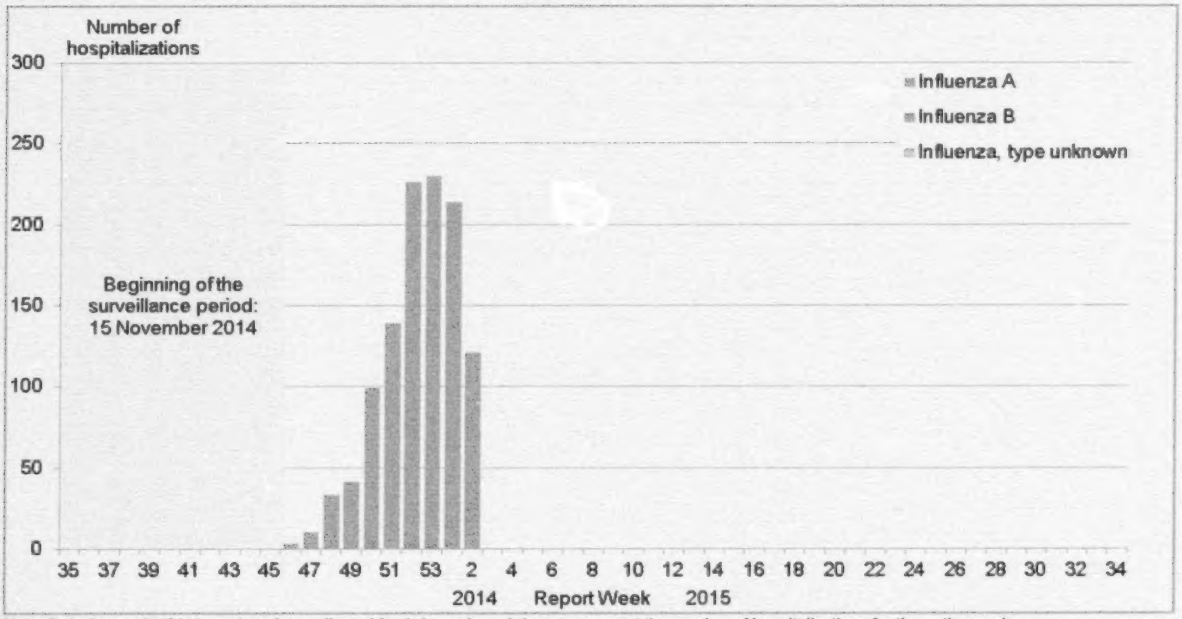
[1] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections. UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

Figure 8 – Number of cases of influenza reported by sentinel hospital networks, by week, Canada, 2014-15

A) Paediatric hospitalizations (≤16 years of age, IMPACT)



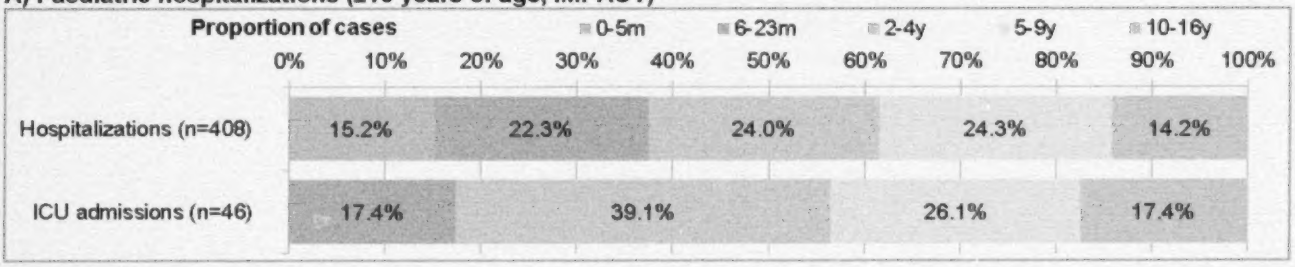
B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



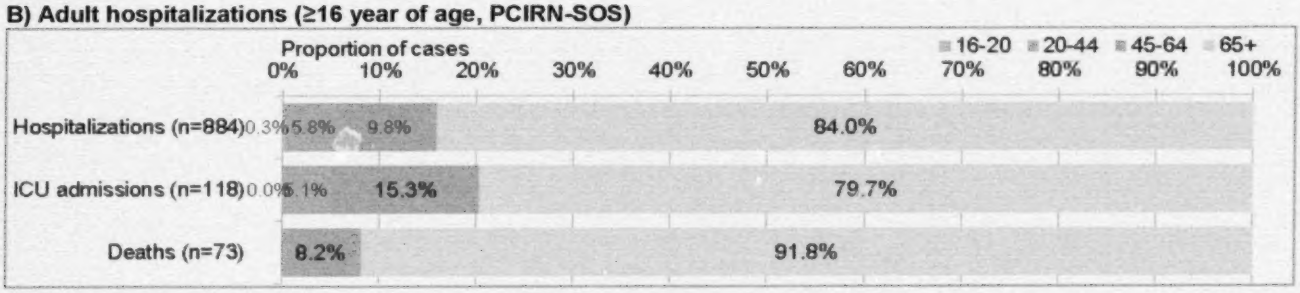
Note: Data for week 46 is based on data collected for 1 day only and do not represent the number of hospitalizations for the entire week.

Figure 9 – Percentage of hospitalizations, ICU admissions and deaths with influenza reported by age-group, Canada, 2014-15

A) Paediatric hospitalizations (≤16 years of age, IMPACT)



B) Adult hospitalizations (≥16 year of age, PCIRN-SOS)



Provincial/Territorial Influenza Hospitalizations and Deaths

In week 02, 461 laboratory-confirmed influenza-associated hospitalizations were reported from participating provinces and territories*; all but five with influenza A, and 77% were reported in adults ≥65 years of age. Since the start of the 2014-15 season, 3127 hospitalizations have been reported; 3072 (98%) with influenza A. Among cases for which the subtype of influenza A was reported, 99.7% (1483/1487) were A(H3N2). The majority of hospitalizations (70%) were reported in adults ≥65 years of age (Table 6). A total of 168 ICU admissions have been reported to date, including 94 ICU admissions in adults ≥65 years of age. A total of 179 deaths have been reported since the start of the season: one child <5 years of age, two children 5-19 years, ten adults 20-64 years, and 166 adults ≥65 years of age. Adults 65 years of age or older represent 93% of all deaths reported this season. Detailed clinical information (e.g. underlying medical conditions) is not known for these cases.

* Note: Influenza-associated hospitalizations are not reported to PHAC by the following Provinces and Territory: BC, NU and QC. Only hospitalizations that require intensive medical care are reported by Saskatchewan. ICU admissions are not distinguished among hospital admissions reported from Ontario. Data may also include cases reported by the IMPACT and PCIRN networks. The number of new influenza-associated hospitalizations and deaths reported for the current week may include cases from Ontario that occurred in previous weeks, as a result of retrospective updates to the cumulative total. It is important to note that the hospitalization or death does not have to be attributable to influenza, a positive laboratory test is sufficient for reporting.

Table 6 – Cumulative number of hospitalizations with influenza reported by the participating provinces and territories, Canada, 2014-15

Age groups (years)	Cumulative (24 Aug. 2014 to 17 Jan. 2015)					
	Influenza A				B	Influenza A and B
	A Total	A(H1) pdm09	A(H3)	A (UnS)	Total	# (%)
0-4	235	1	99	135	3	238 (8%)
5-19	147	0	89	58	4	151 (5%)
20-44	168	1	96	71	5	173 (6%)
45-64	317	2	158	157	7	324 (10%)
65+	2164	0	1001	1163	33	2197 (70%)
Unknown	41	0	40	1	3	44 (1%)
Total	3072	4	1483	1585	55	3127
Percentage[1]	98.2%	0.1%	48.3%	51.6%	1.8%	100.0%

[1] Percentage of tests positive for sub-types of influenza A are a percentage of all influenza A detections.
UnS: unsubtyped: The specimen was typed as influenza A, but no result for subtyping was available.

See additional data on Reported Influenza Hospitalizations and Deaths in Canada: 2009-10 to 2014-15 on the Public Health Agency of Canada website.

Emerging Respiratory Pathogens

Human Avian Influenza

Influenza A(H7N9): Since the last FluWatch report, 15 new laboratory-confirmed cases of human infection with avian influenza A(H7N9) virus have been reported by the World Health Organization. Globally to January 22, 2015, the WHO has been informed of a total of 485 laboratory-confirmed human cases with avian influenza A(H7N9) virus, including 185 deaths.

Documents related to the public health risk of influenza A(H7N9), as well as guidance for health professionals and advice for the public is updated regularly on the following websites:

PHAC – Avian influenza A(H7N9)
WHO – Avian Influenza A(H7N9)

Middle East Respiratory Syndrome Coronavirus (MERS-CoV)

Since the last FluWatch report, 6 new laboratory-confirmed cases of MERS-CoV have been reported by the World Health Organization. Globally, from September 2012 to January 22, 2015, the WHO has been informed of a total of 956 laboratory-confirmed cases of infection with MERS-CoV, including 351 deaths. All cases have either occurred in the Middle East or have had direct links to a primary case infected in the Middle East. The public health risk posed by MERS-CoV in Canada remains low (see the PHAC Assessment of Public Health Risk).

Documents related to the public health risk of MERS-CoV, as well as guidance for health professionals and advice for the public is updated regularly on the following websites:

PHAC – Middle East respiratory syndrome coronavirus (MERS-CoV)
WHO – Coronavirus infections

Avian Influenza A(H5)

The Canadian Food Inspection Agency (CFIA) is continuing its response to an outbreak of avian influenza in British Columbia's Fraser Valley. No new sites have been identified since December 19, 2014, and depopulation of the infected premises is complete. The Agency is monitoring the progress of disposal of dead birds, and cleaning and disinfection of barns, vehicles, equipment and tools on the infected premises. Strict surveillance will continue in the area for the next 90 days and if no additional cases of avian influenza are found within this period, the zone can be considered free of avian influenza. Avian influenza viruses do not pose risks to food safety when poultry and poultry products are properly handled and cooked. Avian influenza rarely affects humans that do not have consistent contact with infected birds. Further information on the outbreak is provided on the following CFIA website.

CFIA - Notifiable Avian Influenza

Enterovirus D68 (EV-D68)

Information related to enterovirus D68, as well as guidance for health professionals and advice for the public is updated regularly on the following website:

PHAC – Non-polio enterovirus

International Influenza Reports

World Health Organization influenza update
World Health Organization FluNet
WHO Influenza at the human-animal interface
Centers for Disease Control and Prevention seasonal influenza report
European Centre for Disease Prevention and Control - epidemiological data
South Africa Influenza surveillance report
New Zealand Public Health Surveillance
Australia Influenza Report
Pan-American Health Organization Influenza Situation Report

FluWatch Definitions for the 2014-2015 Season

Abbreviations: Newfoundland/Labrador (NL), Prince Edward Island (PE), New Brunswick (NB), Nova Scotia (NS), Quebec (QC), Ontario (ON), Manitoba (MB), Saskatchewan (SK), Alberta (AB), British Columbia (BC), Yukon (YT), Northwest Territories (NT), Nunavut (NU).

Influenza-like-illness (ILI): Acute onset of respiratory illness with fever and cough and with one or more of the following - sore throat, arthralgia, myalgia, or prostration which is likely due to influenza. In children under 5, gastrointestinal symptoms may also be present. In patients under 5 or 65 and older, fever may not be prominent.

ILI/Influenza outbreaks

Schools: Greater than 10% absenteeism (or absenteeism that is higher (e.g. >5-10%) than expected level as determined by school or public health authority) which is likely due to ILI. Note: it is recommended that ILI school outbreaks be laboratory confirmed at the beginning of influenza season as it may be the first indication of community transmission in an area.

Hospitals and residential institutions: two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case. Institutional outbreaks should be reported within 24 hours of identification. Residential institutions include but not limited to long-term care facilities (LTCF) and prisons.

Workplace: Greater than 10% absenteeism on any day which is most likely due to ILI.

Other settings: two or more cases of ILI within a seven-day period, including at least one laboratory confirmed case; i.e. closed communities.

Note that reporting of outbreaks of influenza/ILI from different types of facilities differs between jurisdictions.

Influenza/ILI Activity Levels

1 = No activity: no laboratory-confirmed influenza detections in the reporting week, however, sporadically occurring ILI may be reported

2 = Sporadic: sporadically occurring ILI and lab confirmed influenza detection(s) with **no outbreaks** detected within the influenza surveillance region†

3 = Localized: (1) evidence of increased ILI* ;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring in **less than 50% of the influenza surveillance region**†

4 = Widespread: (1) evidence of increased ILI*;
(2) lab confirmed influenza detection(s);
(3) **outbreaks** in schools, hospitals, residential institutions and/or other types of facilities occurring **in greater than or equal to 50% of the influenza surveillance region**†

Note: ILI data may be reported through sentinel physicians, emergency room visits or health line telephone calls.

** More than just sporadic as determined by the provincial/territorial epidemiologist.*

† Influenza surveillance regions within the province or territory as defined by the provincial/territorial epidemiologist.

We would like to thank all the Fluwatch surveillance partners who are participating in this year's influenza surveillance program.

This report is available on the Public Health Agency website at the following address: http://www.phac-aspc.gc.ca/fluwatch/index.html.

Ce rapport est disponible dans les deux langues officielles.